

Combining deep learning and radiomics-based machine learning to optimize predictions on medical images

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Propositions belonging to the thesis

COMBINING DEEP LEARNING AND RADIOMICS-BASED MACHINE LEARNING TO OPTIMIZE PREDICTIONS ON MEDICAL IMAGES

Manon Beauque

“Combining the strengths of handcrafted features and deep learning models can improve handling multiple medical imaging datasets and diverse tasks.” (Adapted from this thesis)

“Using appropriate image pre-processing in the right order can improve the performance of deep neural networks in terms of better classification and segmentation.” (Samira Masoudi et al., 2021)

“Not only is there a need to clearly define the problem and the appropriate measures, but the proposed solution needs to be usable.” (Adapted from this thesis)

“Ask clinicians what problem they would like to have solved, continuously reassess the usefulness of the model during development, and ask clinicians how they would like to interact with the application to ensure model implementation in routine practice.” (Adapted from this thesis)

“Uncertainty predictions are necessary to interpret machine learning model results.” (This thesis)

“To facilitate the adoption of machine learning models in clinical practice, there is a need to explain how the model works.” (Adapted from this thesis)

“Universal generalizability of artificial intelligence algorithms in medicine is likely a myth for current artificial intelligence technology.” (Seong Ho Park et al., 2022)

“Keep learning.” (Andrew Ng)

“Any certainty is inherently contradictory to the philosophy of research.” (Pierre Joliot)